

CLAIMS

1. A method for mitigating adjacent channel interference (ACI) in a
2 wireless communication system, comprising:

4 determining a presence or absence of ACI in each of one or more frequency
ranges in a pre-processed signal comprised of a desired signal component;

6 selecting a particular filter response from among a plurality of possible filter
responses based on the determined presence or absence of ACI in each of the one or
more frequency ranges; and

8 filtering the pre-processed signal with the selected filter response.

2. The method of claim 1, wherein the presence or absence of ACI in the
2 pre-processed signal is determined by

4 filtering the pre-processed signal with a respective ACI detection filter for each
of the one or more frequency ranges, and

6 determining the presence or absence of ACI in each frequency range based on a
filtered signal from the respective ACI detection filter.

3. The method of claim 2, wherein the presence or absence of ACI in the
2 pre-processed signal is further determined by

4 estimating an energy of the filtered signal from each ACI detection filter, and
comparing the estimated energy for each ACI detection filter against a
respective threshold, wherein the presence or absence of ACI in each frequency range is
6 determined based on a result of the comparison.

4. The method of claim 2, wherein each ACI detection filter is implemented
2 as a bandpass filter.

5. The method of claim 2, wherein each ACI detection filter has a response
2 approximately matched to a spectral profile of the ACI in the frequency range being
detected.

6. The method of claim 2, wherein the pre-processed signal is filtered with
2 two ACI detection filters for ACI at an upper band-edge and a lower band-edge of the
desired signal component.

7. The method of claim 6, wherein each ACI detection filter has a response
2 that overlaps a respective band-edge of the desired signal component.

8. The method of claim 1, wherein the presence or absence of ACI in the
2 pre-processed signal is determined via signaling.

9. The method of claim 1, wherein the plurality of possible filter responses
2 are provided by a plurality of sets of filter coefficients.

10. The method of claim 9, wherein the plurality of sets of filter coefficients
2 are for a finite impulse response (FIR) filter.

11. The method of claim 1, wherein the plurality of possible filter responses
2 include a first filter response selected for use if ACI is determined to be present at an
upper band-edge of the desired signal component.

12. The method of claim 1, wherein the plurality of possible filter responses
2 include a second filter response selected for use if ACI is determined to be present at a
lower band-edge of the desired signal component.

13. The method of claim 1, wherein the plurality of possible filter responses
2 include a third filter response selected for use if ACI is determined to be present at both
an upper band-edge and a lower band-edge of the desired signal component.

14. The method of claim 1, wherein the plurality of possible filter responses
2 include a fourth filter response selected for use if ACI is determined to be absent from
the pre-processed signal.

15. The method of claim 1, wherein each of the plurality of possible filter
2 responses is derived to maximize signal-to-noise-and-interference ratio (SINR) based on
a respective hypothesis for the ACI in the pre-processed signal.

16. The method of claim 15, wherein each hypothesis is indicative of a
2 hypothesized location and spectral profile for the ACI in the pre-processed signal.

17. A method for mitigating adjacent channel interference (ACI) in a CDMA
2 system, comprising:

4 pre-processing a received signal comprised of a desired signal component;
filtering the pre-processed signal with a respective ACI detection filter for each
of one or more frequency ranges;

6 determining a presence or absence of ACI in each frequency range based on an
estimated energy of a filtered signal from the respective ACI detection filter and a
8 threshold;

10 selecting a particular filter response from among a plurality of possible filter
responses based on the determined presence or absence of ACI in each of the one or
more frequency ranges, wherein the plurality of possible filter responses are provided
12 by a plurality of sets of filter coefficients for a finite impulse response (FIR) filter; and
filtering the pre-processed signal with the selected filter response.

18. A method for detecting adjacent channel interference (ACI), comprising:
2 filtering a pre-processed signal, comprised of a desired signal component, with a
respective ACI detection filter for each of one or more frequency ranges;

4 estimating an energy of a filtered signal from each ACI detection filter;
comparing the estimated energy for each ACI detection filter against a
6 respective threshold; and
providing an indication of a presence or absence of ACI in each frequency range
8 based on a result of the comparison.

19. A memory communicatively coupled to a digital signal processing
2 device (DSPD) capable of interpreting digital information to:

filter a pre-processed signal, comprised of a desired signal component, with a
4 respective adjacent channel interference (ACI) detection filter for each of one or more
frequency ranges;

6 determine a presence or absence of ACI in each frequency range based on an
estimated energy of a filtered signal from the respective ACI detection filter and a
8 threshold; and

filter the pre-processed signal with a particular filter response selected from
10 among a plurality of possible filter responses based on the determined presence or
absence of ACI in each of the one or more frequency ranges.

20. A digital signal processor comprising:
2 an adjacent channel interference (ACI) detector configured to determine a
presence or absence of ACI in each of one or more frequency ranges in a pre-processed
4 signal comprised of a desired signal component; and
a selectable filter configured to filter the pre-processed signal with a particular
6 filter response selected from among a plurality of possible filter responses based on the
determined presence or absence of ACI in each of the one or more frequency ranges.

21. A receiver processing apparatus comprising:
2 means for determining a presence or absence of adjacent channel interference
(ACI) in each of one or more frequency ranges in a pre-processed signal comprised of a
4 desired signal component; and
means for filtering the pre-processed signal with a particular filter response
6 selected from among a plurality of possible filter responses based on the determined
presence or absence of ACI in each of the one or more frequency ranges.

22. A receiver unit in a wireless communication system, comprising:
2 a front-end unit configured to pre-process a received signal comprised of a
desired signal component;
4 an adjacent channel interference (ACI) detector configured to determine a
presence or absence of ACI in the pre-processed signal in each of one or more
6 frequency ranges; and

8 a selectable filter configured to filter the pre-processed signal with a particular
filter response selected from among a plurality of possible filter responses based on the
determined presence or absence of ACI in each of the one or more frequency ranges.

2 23. The receiver unit of claim 22, wherein the ACI detector includes
one or more ACI detection filters configured to filter the pre-processed signal for
the one or more frequency ranges.

2 24. The receiver unit of claim 23, wherein the ACI detector is configured to
determine the presence or absence of ACI in each frequency range based on an
estimated energy of a filtered signal from the respective ACI detection filter and a
4 threshold.

2 25. The receiver unit of claim 22, wherein the selectable filter is
implemented as a finite impulse response (FIR) filter, and wherein the plurality of
possible filter responses are provided by a plurality of sets of filter coefficients.

2 26. The receiver unit of claim 22, wherein the selectable filter is
implemented as an adaptive filter having coefficients that are adjustable to provide the
plurality of possible filter responses.

27. A terminal comprising the receiver unit of claim 22.

28. A base station comprising the receiver unit of claim 22.

2 29. A receiver apparatus in a wireless communication system, comprising:
means for pre-processing a received signal comprised of a desired signal
component;
4 means for determining a presence or absence of adjacent channel interference
(ACI) in the pre-processed signal in each of one or more frequency ranges; and
6 means for filtering the pre-processed signal with a particular filter response
selected from among a plurality of possible filter responses based on the determined
8 presence or absence of ACI in each of the one or more frequency ranges.